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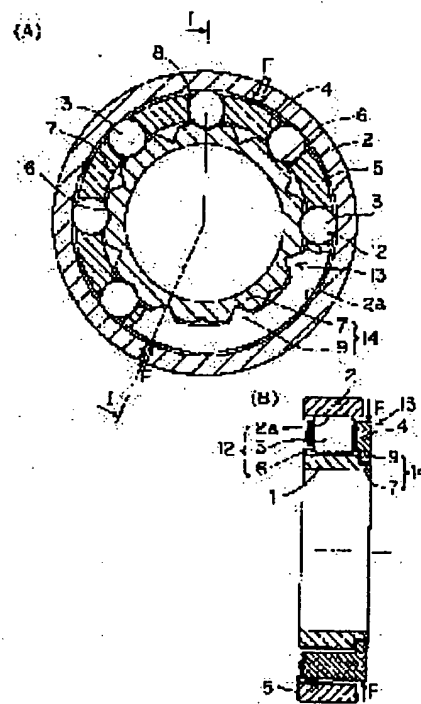
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(54) TWO-WAY SIMULTANEOUS IDLING/LOCKING SWITCHING CLUTCH

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a clutch with novel functions capable of keeping the locked condition in both the forward and reverse directions, and simultaneously rotatable in either the forward direction or the reverse direction by the external operation.

SOLUTION: A V-shaped grooved cam surface 6 is provided on an outside diameter surface of an inner race 1, and an inside diameter surface of an outer race 2 is a circumferential receway surface 2a. A rolling element 3 to lock the relative rotation between the inner and outer races 1, 2 through the friction contact with the surfaces 6, 2a is interposed therebetween. When the rolling element 3 is present in the center of the cam surface 6, clearance are generated both in the radial direction and in the circumferential direction between the outer race, the rolling element and the cam surface. The rolling element 3 is held in a pocket of a holder 4. A projecting engagement part 9 and a holder fixing groove 7 which are loosely engaged with each other are provided on the holder 4 and the inner race 1. The projecting part 9 and the groove 7 are closely engaged with each other by applying the external force F to the holder 4, and pressing the holder against the inner race 1, and the holder 4 is fixed to the inner race 1 so that the rolling element 3 is located at the center of the cam surface 6.



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CLAIMS

[Claim(s)]

[Claim 1] It is the 1st rotation member pivotable to right reverse and the 2nd rotation member, and always 2-way coincidence slip / lock change clutch equipped with a lock means to lock rotation of the forward reverse both directions between said both rotation members, and a lock discharge means to cancel the lock of said lock means in the pivotable condition to forward reverse both directions by predetermined external force being added, mutually.

[Claim 2] The 1st pivotable rotation member and the 2nd rotation member are mutually prepared in right reverse. The cam side which prepares the periphery orbital plane of the circumference of the center of rotation in the rotation member of the either these [1st] or the 2nd rotation member, and meets it with said periphery orbital plane at the rotation member of another side is established. Between said periphery orbital planes and cam sides The engagement child who does friction contact to these both sides, and locks rotation of the forward reverse both directions of said rotation member is made to intervene. Said cam side is that form the cage which said friction contact shall be canceled by maintaining said engagement child at the center valve position of this cam side, and holds said engagement child in the location regulation condition in the hand of cut of a rotation member, and predetermined external force is added in this cage. 2-way coincidence slip / lock change clutch which established the guidance means made into a restricted condition to said rotation member so that said engagement child's location may turn into said center valve position of said cam side.

[Claim 3] Said 1st and 2nd rotation members are members located in and abroad mutually. Said periphery orbital plane and cam side are a field which counters in the direction of a path of these rotation member. Said cam side is established in two or more places of the circumferential direction of a rotation member, and said engagement child consists of a rolling element prepared for said every cam side. Said cam side It is formed so that the center section of the rotation member circumferential direction may become it is deep and gradually shallow on both sides, and that center section serves as said center valve position. In this center valve position 2-way coincidence slip / lock change clutch according to claim 2 which the direction clearance of a path between some shall produce at cam face-to-face spacing with said periphery orbital plane to the path of said rolling element.

[Claim 4] Said guidance means becomes by the cage fixed slot established in the rotation member by the side of formation of said cam groove, and either of said cages, and the engagement projected part prepared in another side. Loosen mutually [a these cage fixed slot and an engagement projected part] in the state of un-giving [of said external force], and it gears in the condition. And 2-way coincidence slip / lock change clutch according to claim 3 which prepared the elastic body which shall get into gear densely in the state of grant of said external force, and gives predetermined frictional force between said cages and rotation members by the side of said periphery orbital plane.

[Claim 5] It is the 2-way coincidence slip / lock change clutch according to claim 4 which an engagement projected part gears with said cage fixed slot in the direction of a path mutually , and made said cage the quality of the material in which elastic deformation is possible by said external force , prepared the pivotable operating member on the center of rotation of said rotation member , and this heart , and established respectively the cam side for actuation which makes the direction force of a path it is weak to said external force with rotation of an operating member at this operating member and said cage act on said cage .

[Claim 6] It is that with which said cage fixed slot and an engagement projected part gear to shaft orientations mutually. On the center of rotation of said rotation member, and this heart, meet the side face of said cage and a pivotable operating member is prepared. 2-way coincidence slip / lock change clutch according to claim 4 which established respectively the cam side for actuation which makes the axial force which turns into said external force with rotation of an operating member act on this operating member and said cage at said cage, and prepared the elastic body for a return which energizes said operating member in the direction which separates from a cage.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] Although this invention cannot rotate the normal rotation / inversion direction freely, a part for the machine structured division, for example, the natural condition, of various kinds of devices, it relates to 2-way coincidence slip / lock change clutch which can be used for a part for the machine structured division to which the normal rotation / inversion direction needs the function which can be rotated freely for coincidence if needed.

[0002]

[Description of the Prior Art] For example, the wheel of a wheelbarrow and the wheel of a door can be moved in an inclined plane for horizontal component of a force or inertial force, unless it stops by a certain approach. For this reason, the present condition is adding a brake mechanism to an external empty vehicle ring depending on an application, and aiming at prevention of risk. The typical example of structure of the one-way clutch known from the former by drawing 18 is shown. This clutch consists of 83, a cage 84, and a spring 85 at a shaft 81, an outer ring of spiral wound gasket 82, and the time. The inclination-cam-die side 86 is established in the outer ring of spiral wound gasket 82, and a spring 85 forces a roller 83 on a narrow cam side side, and has structure immediately locked to the rotation to the clockwise rotation of an outer ring of spiral wound gasket 82 at the time of axial immobilization. Moreover, the typical example of structure of a two-way clutch is shown in drawing 19. The descriptions of this clutch are having two inclination-cam-die sides 97 which counter mutually in an outer ring of spiral wound gasket 92, and having a means (this example lever 98) for moving a cage 94 to a hoop direction if needed. By this, it can have the function which changes the lock direction of an outer ring of spiral wound gasket 92 in a clockwise rotation or a counterclockwise rotation.

[0003]

[Problem(s) to be Solved by the Invention] An one-way clutch only locks only the rotation to an one direction as an identifier, and although a two-way clutch has the function locked only in a clockwise rotation or a counterclockwise rotation by actuation of a lever etc., it does not have the function which locks bidirectional rotation. Therefore, there was no function as a clutch which the wheel of the wheelbarrow which requires safety, the wheel for doors, etc. require.

[0004] The purpose of this invention is offering 2-way coincidence slip / lock change clutch with the new function maintaining a lock condition in any direction of the normal rotation / inversion direction, and any direction of the normal rotation / inversion direction becoming pivotable by actuation from the outside at coincidence.

[0005]

[Means for Solving the Problem] 2-way coincidence slip / lock change clutch of this invention is the 1st rotation member pivotable to right reverse and the 2nd rotation member, and always mutually equipped with a lock means to lock rotation of the forward reverse both directions between said both rotation members, and a lock discharge means to cancel the lock of said lock means in the pivotable condition to forward reverse both directions by predetermined external force being added. In addition, the "rotation member" said on these specifications is a member in which relative rotation is possible, and rotation member of one of the two may always be used in the state of include-angle immobilization. According to this configuration, with the lock means, rotation is locked so that mutual relative rotation may be impossible, namely, rotation is prevented, it is applying predetermined external force to a lock discharge means, and the lock of said lock means is canceled and the 1st rotation member and the 2nd rotation member always become that rotation of the forward reverse both directions between the 1st rotation member and the 2nd rotation member is possible.

[0006] In the above-mentioned configuration, said lock means and a lock discharge means can be done with the next configuration. A lock means is constituted from an engagement child who intervenes between said periphery orbital plane, the cam side which counters, and these peripheries orbital plane and a cam side, does friction contact to these both sides, and locks rotation of the forward reverse both directions of said rotation member by one rotation member of the 1st and 2nd rotation members by being prepared in the periphery orbital plane prepared in the circumference of the center of rotation, and the rotation member of another side. Said friction contact shall be canceled because said cam side maintains said engagement child at the center valve position of this cam side. A lock discharge means consists of following cages and guidance means. A cage shall hold said engagement child in the location regulation condition in the hand of cut of a rotation member. By predetermined external force being added, said guidance means shall change said cage into a restricted condition to said rotation member so that said engagement child's location may turn into said center valve position of said cam side. In this configuration, an engagement child does friction contact in the periphery orbital plane of one rotation member, and the cam side of the rotation member of another side, and rotation of the forward reverse both directions between these rotation members is always locked. At this time, an engagement child is in the location which inclined in the direction of either from the center valve position of a cam side. If predetermined external force is given to a cage, a cage is guided with a guidance means, moves a little, and locates in the center valve position of said cam side the engagement child who holds. Said friction contact is canceled by an engagement child being maintained at a center valve position, and, thereby, the relative rotation of both the rotation member of said cam side is attained in both directions.

[0007] In 2-way coincidence slip / lock change clutch of this configuration, it is good also as a next configuration. Said 1st and 2nd rotation members are used as the member located in and abroad mutually, and make said periphery orbital plane and cam side the field which counters in the direction of a path of these rotation member. Said cam side is established in two or more places of the circumferential direction of a rotation member. Said engagement child is taken as the rolling element prepared for said every cam side. Moreover, it shall be formed so that the center section of the rotation member circumferential direction

may become it is deep and gradually shallow on both sides, and that center section shall serve as said center valve position, said cam side shall be this center valve position, and the direction clearance of a path between some shall produce it at said periphery orbital plane and cam face-to-face spacing to the path of said rolling element. If relative rotation of the direction of either always arises a little in the 1st and 2nd rotation member in this configuration, with this rotation, the rolling element which is an engagement child will move a cam side to the shallow location which inclined from the center valve position, will carry out friction contact at a cam side and a periphery orbital plane, and will prevent rotation beyond it of a rotation member. When a rotation member rotates to the above and hard flow, a rolling element moves to the location which inclined toward the above and hard flow from the center valve position of a cam side, and prevents rotation of the body of revolution beyond it. If predetermined external force is given to a cage, a cage is guided with a guidance means, moves a little, and locates the rolling element currently held in the deepest center valve position of a cam side. Therefore, the lock of rotation of both directions is canceled by coincidence.

[0008] Moreover, in this configuration, it is good also considering each part as a next configuration. Said guidance means shall become by the cage fixed slot established in the rotation member by the side of formation of said cam groove, and either of said cages, and the engagement projected part prepared in another side, in the state of un-giving [of said external force], a these cage fixed slot and an engagement projected part loosen mutually, and it shall gear in the condition and they shall gear densely in the state of grant of said external force. The elastic body which gives predetermined frictional force is prepared between said cages and rotation members by the side of said periphery orbital plane. In this configuration, the cage fixed slot and the engagement projected part loosened, it has geared in the condition, and relative rotation with a cage and the rotation member by the side of a cam side is always attained in this slack range. Therefore, the function to hold a rolling element in the center valve position of a cam side with a cage is not produced, but rotation of the both directions of both the rotation member is locked by friction contact of a rolling element as mentioned above. If predetermined external force is given to a cage, an engagement projected part gears with a cage fixed slot densely, and a cage will be restrained by the rotation member by the side of a cam side, and will hold the rolling element currently held in the center valve position of a cam side. Therefore, rotation of the both directions of a rotation member is attained. When making it into a lock condition again except for external force after lock discharge, an elastic body produces the circumference of the companion of the cage by rotation of the rotation member by the side of a periphery orbital plane, and, thereby, produces a lock certainly so that a rolling element may move to the shallow location of a cam side.

[0009] Furthermore, in this configuration, it shall gear in the direction of a path mutually, and said cage makes said cage fixed slot and an engagement projected part the quality of the material in which elastic deformation is possible by said external force. A pivotable operating member may be prepared on the center of rotation of said rotation member, and this heart, and the cam side for actuation which makes the direction force of a path it is weak to said external force with rotation of an operating member at this operating member and said cage act on said cage may be established. If an operating member is rotated from a rotation lock condition in this configuration, in an operation of the cam side for actuation, the direction force of a path will be given to a cage, a cage will carry out elastic deformation by this direction force of a path, and an engagement projected part will gear with a cage fixed slot densely. As mentioned above, a rolling element is held in the center valve position of a cam side, and rotation of the both directions of a rotation member of it is attained from this.

[0010] This cage fixed slot and an engagement projected part are good also as that which gears to shaft orientations mutually. In this case, on the center of rotation of a rotation member, and this heart, the side face of said cage is met, a pivotable operating member is prepared, and the cam side for actuation which makes the axial force which turns into said external force with rotation of an operating member at this operating member and said cage act on said cage is established. Moreover, the elastic body for a return which energizes said operating member in the direction which separates from a cage is prepared. If an operating member is rotated from a rotation lock condition in this configuration, in an operation of the cam side for actuation, axial force will be given to a cage and an engagement projected part will gear with a cage fixed slot densely. As mentioned above, a rolling element is held in the center valve position of a cam side, and rotation of the both directions of a rotation member of it is attained from this.

[0011]

[Embodiment of the Invention] The 1st operation gestalt of this invention is explained with drawing 1 thru/or drawing 7. This 2-way coincidence slip / lock change clutch consists of the inner ring of spiral wound gasket 1 which is the 1st rotation member, the outer ring of spiral wound gasket 2 which is the 2nd rotation member, a rolling element 3 which is the engagement child who consists of time, a cage 4, and elastic bodies 5, such as flat spring, and the below-mentioned lock means 12 and the below-mentioned lock discharge means 13 are established. So to speak, this 2-way coincidence slip / lock change clutch applies 2 Wake latch's basic structure.

[0012] The inner ring of spiral wound gasket 1 is formed in the shape of a thick cylinder, as shown in drawing 2, and the cam side 6 for demonstrating the lock function as a clutch is established in the outer-diameter side at two or more places of a circumferential direction. Each cam side 6 is established at equal intervals. These cam side 6 is formed so that the center section of the circumferential direction may become it is deep and gradually shallow on both sides, and it is made in general into the V character-like cross-section configuration. This cam side 6 may be a straight line-like like drawing 3 (A), or as shown in this drawing (B), it may have the shape of a curved surface, such as the shape of concave radii. The aperture include angle alpha of the shape of V character of the cam side 6 is set as 155 degrees - 175 degrees. Although the cam side 6 is established in the overall length of the shaft orientations of an inner ring of spiral wound gasket 1, it may be established in some shaft orientations. The cage fixed slot 7 is established in the outer-diameter side of the end panel of one side of an inner ring of spiral wound gasket 1 at two or more places of a circumferential direction. For example, the cage fixed slot 7 is formed a cam groove 6 and by turns. The cage fixed slot 7 is the thing of the cross-section configuration to which the core of a flute width becomes deep, and is made in general into the V character-like cross-section configuration in this example. The V character-like inclination is made into the steep slope compared with the cam groove 6. In addition, although [an inner ring of spiral wound gasket 1 / this example] it is cylindrical, it may be a shaft. That is, the cam groove 6 and the cage fixed slot 7 may be directly processed into the shaft.

[0013] As shown in drawing 1, it is referred to as cylinder side-like periphery orbital plane 2a by the outer ring of spiral wound gasket 2 so that **** may be possible for the rolling element 3 which consists a part for the bore surface part of time. A lock means 12 to prevent relative rotation of the forward reverse both directions of an inner ring of spiral wound gasket 1 and an outer ring of spiral wound gasket 2 consists of periphery orbital plane 2a of an outer ring of spiral wound gasket 2, a cam groove 6 of an inner ring of spiral wound gasket 1, and a rolling element 3. Although the outer ring of spiral wound gasket 2 is used as thick-cylinder-like components in this example, outer-diameter sides may be not only a cylinder side but a wheel configuration

and a pulley configuration or the arbitration configuration according to the other purposes. Moreover, in this example, the outer ring of spiral wound gasket 2 is formed in narrow rather than the inner ring of spiral wound gasket 1 and the cage 4 so that the outer-diameter side by the side of the engagement projected part 9 (it mentions later) of a cage 4 may be exposed.

[0014] The engagement projected part 9 which a cage 4 is formed in the shape of a cylinder as shown in drawing 4, the pocket 8 holding a rolling element 3 is penetrated and formed in two or more places of a circumferential direction at the diameter of inside and outside, and gears with each cage fixed slot 7 of an inner ring of spiral wound gasket 1, and the pin 10 for spring immobilization are respectively formed in hoop direction two or more parts. The engagement projected part 9 is formed in the bore side of a cage 4, and is made into triangular Yamagata. The pin 10 for spring immobilization is formed in end panel with the engagement projected part 8 in a cage 4, and the end panel of the opposite side. The guidance means 14 consists of an engagement projected part 9 of a cage 4, and a cage fixed slot 7 of an inner ring of spiral wound gasket 1. Moreover, the lock discharge means 13 consists of this guidance means 14 and cage 4.

[0015] Drawing 5 shows the condition of having attached the elastic body 5 to a cage 4. An elastic body 5 consists of flat spring which consists of ring-like side plate 5a and two or more piece of spring 5b of the shape of an arm prolonged in a radial from this side plate. Piece of spring 5b is bent so that it may extend in a slanting outer-diameter side from side plate 5a and the amount of point may become shaft orientations and abbreviation parallel, and the amount of the point forces it on the bore side of an outer ring of spiral wound gasket 2, and it contacts a condition. An elastic body 5 inserts in the hole of side plate 5a the pin 10 for spring immobilization prepared in the cage 4, and is being fixed to the cage 4 by fastening *****. Immobilization of an elastic body 5 is based on fastening, and also joining, a ***** stop, a rivet stop, or adhesion is sufficient as it.

[0016] Since the function a cage 4 holds, takes and turns [a function] around fixed frictional force to rotation of an outer ring of spiral wound gasket 2 should just be obtained, elastic bodies other than a spring member, such as rubber, may be used for an elastic body 5. For example, as a modification is shown in drawing 9, elastic body 5A of the shape of a ring which consists of an O ring etc. is embedded in the periphery slot established in the outer-diameter side of a cage 4, or contrary to this, you may form a periphery slot in the bore side of an outer ring of spiral wound gasket 2, and may also embed a ring-like elastic body. The line spring or flat spring (not shown) crooked in the wave instead of may be used for a ring-like elastic body. [an O ring] Moreover, you may make it embed elastic body 5B in the crevice locally established in the outer-diameter side of a cage 4, as shown in drawing 10. Furthermore, a cage 4 is made into a polygon, or a projected part is prepared in the outer-diameter side of a cage 4, and the fixed frictional force which is extent which two or more places of the hoop direction of a cage 4 take to an outer ring of spiral wound gasket 2 in the bore side of an outer ring of spiral wound gasket 2 with the elasticity of cage 4 the very thing, and the surroundings produce may be made to be acquired instead of preparing such an elastic body.

[0017] The clutch symbol description of the above-mentioned configuration and auxiliary explanation of a configuration are given. In the state of the ideal in the natural condition which shows in drawing 1, like drawing 6 (A), there is a rolling element 3 in the center (center valve position) of the cam side 6, and, as for the engagement projected part 9 of a cage 4, and the cage fixed slot 7 of an inner ring of spiral wound gasket 1, a phase's corresponds with coincidence in the location of a hoop direction. Moreover, the pocket 8 of the cage 4 for putting in a rolling element 3 is designed so that the hoop direction clearance to a rolling element 3 may turn into that it is very small (1% or less of the diameter of a rolling element 3), or a negative clearance. In this condition, as shown in drawing 1 (B), when a cage 4 is pushed against an inner ring of spiral wound gasket 1 by external force F in the direction of a path from an outer-diameter part, like drawing 6 (B), the pushed part bends, the clearance between the engagement projected part 9 of a cage 4 and the cage fixed slot 7 of an inner ring of spiral wound gasket 1 of a cage 4 is lost, and, as for a cage 4, the phase relation of a hoop direction is fixed to an inner ring of spiral wound gasket 1. Consequently, the rolling element 3 of total is compulsorily held in the center which is the center valve position of the cam side 6. The part which pushes a cage 4 to an inner ring of spiral wound gasket 1 has the desirable part equally divided into 2-4 to a circumferential direction.

[0018] In this condition, relative rotation of an inner ring of spiral wound gasket 1 and the cage 4 cannot be carried out in a hoop direction. Moreover, when located in the center of the cam side 6, the rolling element 3 is set up so that it may have few clearances between radial to an outer ring of spiral wound gasket 2 (the clearance between hoop directions is also produced as a result). Therefore, the rotation lock function as a clutch is lost in this condition. Namely, rotation of an outer ring of spiral wound gasket 2 is attained in any direction of the forward direction (for example, it considers as a clockwise rotation), and hard flow.

[0019] If the external force F which pushes a cage 4 is removed, it will return to the condition of drawing 6 (A). From this condition, by immobilization, an outer ring of spiral wound gasket 2 will begin rotation clockwise to rotation and coincidence of an outer ring of spiral wound gasket 2 according to the effectiveness of the frictional force according [a cage 4] to the spring member 5, if an inner ring of spiral wound gasket 1 rotates clockwise. Consequently, although it is very small angle of rotation since the rolling element 3 contained by the pocket 8 of a cage 4 also rotates clockwise to coincidence, a rolling element 3 interferes someday with the cam side 6 of an inner ring of spiral wound gasket 1. As the condition that the rolling element 3 interfered with the cam side 6 of an inner ring of spiral wound gasket 1 is shown in drawing 7, as for the point of contact of the cam side 6 and an outer ring of spiral wound gasket 2, and the include angle beta to make, a rolling element 3 becomes 5-25 degrees [180 degree- (155 degrees - 175 degrees)]. This include angle is known as a SUTORATO angle of a common clutch.

[0020] If it will be in the condition of drawing 7 (A), an outer ring of spiral wound gasket 2 will become impossible [rotating clockwise more than it]. That is, the rotation lock function as a clutch will arise here. In this case, the engagement projected part 9 of a cage 4 is set as a dimension which does not interfere in the cage fixed slot 7 of an inner ring of spiral wound gasket 1 yet. Also when an outer ring of spiral wound gasket 2 rotates counterclockwise, each part article carries out the same motion as the above, and a rotation lock function produces it. That is, unless external force F is given to a cage 4, an outer ring of spiral wound gasket 2 cannot be rotated counterclockwise clockwise. What is necessary is to apply external force F again to a cage 4, and just to push a cage 4 against an inner ring of spiral wound gasket 1, when returning the original bidirectional rotation to a slip condition. Since a rolling element 3 moves in the center of the cam side 6, the rotation lock function of it is lost again.

[0021] Thus, this 2-way coincidence slip / lock change clutch can be changed to considering as a slip condition in any direction of a clock and a counterclockwise rotation at coincidence, and the condition of producing a rotation lock function in coincidence, by applying external force F to a cage 4. For this reason, for example, when this clutch is used with the bearing for a wheelbarrow or doors, if its hold is released, the safe device in which it has stopped at that location can realize a wheel and a door cheaply.

[0022] Drawing 8 shows the example which formed the operating member 16 for external force grant to 2-way coincidence slip / lock change clutch shown in drawing 1 - drawing 7. An operating member 16 is a member of the shape of a ring which has lever section 16a in a part of circumferential direction, and the outer-diameter side of a shaft 20 in which the inner ring of spiral wound gasket 1 was attached is made to have made fitting of the rotation of it free. An inner ring of spiral wound gasket 1 turns

to said level difference side 20a side the end panel which separates from the level difference side between the narrow diameter portion of a shaft 20, and a major diameter a little, and has fixed to the fitting condition in the narrow diameter portion, and has the cage fixed slot 7, and is arranged, and the operating member 16 intervenes between an inner ring of spiral wound gasket 1 and said level difference side 20a. the collar with which an operating member 16 is located in the periphery of a cage 4 — it has ring section 16b of a **, and the cam side 17 for actuation which makes the direction force of a path it is weak to said external force F with rotation of an operating member 16 act on a cage 4 is established in hoop direction two or more parts (illustration four places) of the bore side of this ring section 16b. The cam side 17 for actuation is formed in the straight line used as some bowstrings of a circle used as the bore side of ring section 16b. Moreover, two or more cam sides 18 for actuation which touch the cam side 17 for these actuation respectively are formed in the outer-diameter side of a cage 4 by the projected part of a circular cross section.

[0023] Thus, when an operating member 16 is formed, if an operating member 16 is turned a predetermined include angle (the example of illustration about 45 degrees) from the rotation lock condition shown in drawing 8 (A), the cam side 17 for actuation and 18 comrades will be engaged for each other, and the external force of the direction of a path which pushes a cage 4 against an inner ring of spiral wound gasket 1 will be given to a cage 4 from an operating member 16. Thereby, a cage 4 bends and it will be in the discharge condition of the rotation lock as a clutch. If an operating member 16 is returned to the include angle of original drawing 8 (A), a cage 4 will return to the original configuration with elasticity, and will return to a rotation lock condition. In addition, the example of this drawing is the same configuration as the example shown in the cage 4 at drawing 1 - drawing 7 except for having established the cam side 18 for actuation, and having formed the operating member 16.

[0024] Drawing 11 thru/or drawing 14 show the 2nd operation gestalt of this invention. This example changes a rotation lock condition and a lock discharge condition by giving the external force of shaft orientations to a cage 4. This example is drawing 1 thru/or the same structure as the example of drawing 7 except for having changed the configuration of guidance means 14A which consists of a part of cage 4 and inner ring of spiral wound gasket 1, and the width of face of an outer ring of spiral wound gasket 2. However, a cage 4 does not need to be the quality of the material in which elastic deformation is possible. As shown in drawing 12, cage fixed slot 7A which gears with engagement projected part 9A (drawing 13) of a cage 4 is prepared in a part of end panel of an inner ring of spiral wound gasket 1. A cage 4 shall have a flange 19 in the 1 side of a bore side, and engagement projected part 9A is prepared inside this flange 19. Cage fixed slot 7A considers as V groove, and engagement projected part 9A is made into Yamagata of the shape of a triangle corresponding to this cage fixed slot 7A of V groove. Guidance means 14A is constituted by these cage fixed slot 7A and engagement projected part 9A. The configuration of the cam groove 6 of an inner ring of spiral wound gasket 1 is the same as the example of drawing 1.

[0025] At this example, it is the external force FA of shaft orientations about a change in a slip condition and the rotation lock condition. It carries out by pushing a cage 4 against an inner ring of spiral wound gasket 1. If a cage 4 is pushed against shaft orientations, since cage fixed slot 7A of an inner ring of spiral wound gasket 1 will gear with engagement projected part 9A of a cage 4, a cage 4 will be fixed to an inner ring of spiral wound gasket 1 and the rolling element 3 as well as the aforementioned example will be held in the center of the cam side 6, it will be in a slip condition to the both directions of a clock and a counterclockwise rotation. External force FA If it removes, it will be in a rotation lock condition to the both directions of a clock and a counterclockwise rotation like the 1st operation gestalt. In addition, in order to improve responsibility of a change in a slip condition and the rotation lock condition with the 2nd operation gestalt of drawing 11, it is desirable to establish a means to return a cage 4 positively, according to another external force P, as shown in drawing 11 (B).

[0026] Drawing 15 and drawing 16 show the example which prepared operating member 16A for external force grant to 2-way coincidence slip / lock change clutch of the operation gestalt shown in drawing 11 - drawing 14. Operating member 16A is the member of the shape of a ring which has lever section 16a in a part of circumferential direction, and the outer-diameter side of a shaft 20 in which the inner ring of spiral wound gasket 1 was attached is made to have made fitting of the rotation of it free. An inner ring of spiral wound gasket 1 turns to said level difference side side the end panel which separates from level difference side 20a between the narrow diameter portion of a shaft 20, and a major diameter a little, and has fixed to the fitting condition in the narrow diameter portion, and has cage fixed slot 7A, and is arranged, and operating member 16A intervenes between an inner ring of spiral wound gasket 1 and said level difference side. It follows on rotation of operating member 16A in hoop direction two or more parts (illustration four places) of the end panel of a cage 4, and the field which counters, and operating member 16A is said external force FA. Cam side 17A for actuation which makes the weak direction force of a path act on a cage 4 is prepared. Moreover, two or more cam side 18A for actuation which touches respectively cam side 17A for these actuation is formed in the end panel of a cage 4. The cam sides 17A and 18A for these actuation are made into Yamagata of the shape of V character of loose inclination. The part between cam side 17A for ***** actuation is set to flat surface part 17B. in addition, this loose V character-like Yamagata of inclination — either of the cam sides 17A and 18A for actuation — it was — partial heights are sufficient as others. Moreover, the elastic body 21 for a return which acquires said external force P is attached in the cage 4 in the built-in condition at drawing 16 B. This elastic body 21 for a return consists of flat spring, is prepared in the bore side of a cage 4 along the direction of a path, is inserted in the attachment slot 22, and is attached in the condition.

[0027] Thus, when operating member 16A is prepared, if operating member 16A is turned a predetermined include angle (the example of illustration about 45 degrees) from the rotation lock condition shown in drawing 15 (A), cam side 17for actuation A and 18A comrade will be engaged for each other, and the external force of the shaft orientations which push a cage 4 against an inner ring of spiral wound gasket 1 will be given to a cage 4 from operating member 16A. Thereby, a cage 4 bends and it will be in the discharge condition of the rotation lock as a clutch. If operating member 16A is returned to the include angle of original drawing 15 (A), a cage 4 will return by the stability of the elastic body 21 for a return, and will return to a rotation lock condition. In addition, the example of this drawing is the same configuration as the example shown in the cage 4 at drawing 11 - drawing 14 except for having prepared cam side 18A for actuation, having prepared operating member 16A, and having formed the elastic body 21 for a return.

[0028] Drawing 17 shows the example which the sheet back for cars also hung down 2-way coincidence slip / lock change clutch A of this invention, and was used as an adjusting device whenever [angle-of-inclination]. The back board 31 of a sheet 30 is supported by the back board supporter material 32 free [engagement], and 2-way coincidence slip / lock change clutch A is arranged so that the tilt core and center position of this back board 21 may be in agreement. Either that inner ring of spiral wound gasket 1 and the outer ring of spiral wound gasket 2 are fixed to the back board supporter material 32, and, as for this clutch A, another side is fixed to a back board 31. In addition, the return spring 33 energized to a standing-up side is formed in the back board 31. Clutch A may be the thing of which said operation gestalt.

[0029] In addition, although the rolling element 3 was used as an engagement child in contact with the cam side 6 with said each

operation gestalt, the engagement child of the cross-section configuration of a non-round shape may be used instead of a rolling element 3. Moreover, with said each operation gestalt, although the cam side 6 was established in the inner ring of spiral wound gasket 1 and periphery orbital plane 2a was respectively established in the outer ring of spiral wound gasket 2, contrary to this, a periphery orbital plane may be established in an inner ring of spiral wound gasket 1, and a cam side may be established in an outer ring of spiral wound gasket 2. Furthermore, instead of considering as an inner ring of spiral wound gasket 1 and an outer ring of spiral wound gasket 2 like said each operation gestalt, the 1st rotation member and the 2nd rotation member may be used as the member which meets shaft orientations mutually, and may make a cam side and a periphery orbital plane meet shaft orientations.

[0030]

[Effect of the Invention] 2-way coincidence slip / lock change clutch of this invention maintains a lock condition in any direction of the normal rotation / inversion direction, and is made with a thing with the function which does not have an example in the former that any direction of the normal rotation / inversion direction becomes pivotable by actuation from the outside at coincidence.

[Translation done.]

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TECHNICAL FIELD

[Field of the Invention] Although this invention cannot rotate the normal rotation / inversion direction freely, a part for the machine structured division, for example, the natural condition, of various kinds of devices, it relates to 2-way coincidence slip / lock change clutch which can be used for a part for the machine structured division to which the normal rotation / inversion direction needs the function which can be rotated freely for coincidence if needed.

[Translation done.]

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PRIOR ART

[Description of the Prior Art] For example, the wheel of a wheelbarrow and the wheel of a door can be moved in an inclined plane for horizontal component of a force or inertial force, unless it stops by a certain approach. For this reason, the present condition is adding a brake mechanism to an external empty vehicle ring depending on an application, and aiming at prevention of risk. The typical example of structure of the one-way clutch known from the former by drawing 18 is shown. This clutch consists of 83, a cage 84, and a spring 85 at a shaft 81, an outer ring of spiral wound gasket 82, and the time. The inclination-cam-die side 86 is established in the outer ring of spiral wound gasket 82, and a spring 85 forces a roller 83 on a narrow cam side side, and has structure immediately locked to the rotation to the clockwise rotation of an outer ring of spiral wound gasket 82 at the time of axial immobilization. Moreover, the typical example of structure of a two-way clutch is shown in drawing 19. The descriptions of this clutch are having two inclination-cam-die sides 97 which counter mutually in an outer ring of spiral wound gasket 92, and having a means (this example lever 98) for moving a cage 94 to a hoop direction if needed. By this, it can have the function which changes the lock direction of an outer ring of spiral wound gasket 92 in a clockwise rotation or a counterclockwise rotation.

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EFFECT OF THE INVENTION

[Effect of the Invention] 2-way coincidence slip / lock change clutch of this invention maintains a lock condition in any direction of the normal rotation / inversion direction, and is made with a thing with the function which does not have an example in the former that any direction of the normal rotation / inversion direction becomes pivotable by actuation from the outside at coincidence.

[Translation done.]

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] An one-way clutch only locks only the rotation to an one direction as an identifier, and although a two-way clutch has the function locked only in a clockwise rotation or a counterclockwise rotation by actuation of a lever etc., it does not have the function which locks bidirectional rotation. Therefore, there was no function as a clutch which the wheel of the wheelbarrow which requires safety, the wheel for doors, etc. require.

[0004] The purpose of this invention is offering 2-way coincidence slip / lock change clutch with the new function maintaining a lock condition in any direction of the normal rotation / inversion direction, and any direction of the normal rotation / inversion direction becoming pivotable by actuation from the outside at coincidence.

[Translation done.]

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MEANS

[Means for Solving the Problem] 2-way coincidence slip / lock change clutch of this invention is the 1st rotation member pivotable to right reverse and the 2nd rotation member, and always mutually equipped with a lock means to lock rotation of the forward reverse both directions between said both rotation members, and a lock discharge means to cancel the lock of said lock means in the pivotable condition to forward reverse both directions by predetermined external force being added. In addition, the "rotation member" said on these specifications is a member in which relative rotation is possible, and rotation member of one of the two may always be used in the state of include-angle immobilization. According to this configuration, with the lock means, rotation is locked so that mutual relative rotation may be impossible, namely, rotation is prevented, it is applying predetermined external force to a lock discharge means, and the lock of said lock means is canceled and the 1st rotation member and the 2nd rotation member always become that rotation of the forward reverse both directions between the 1st rotation member and the 2nd rotation member is possible.

[0006] In the above-mentioned configuration, said lock means and a lock discharge means can be done with the next configuration. A lock means is constituted from an engagement child who intervenes between said periphery orbital plane, the cam side which counters, and these peripheries orbital plane and a cam side, does friction contact to these both sides, and locks rotation of the forward reverse both directions of said rotation member by one rotation member of the 1st and 2nd rotation members by being prepared in the periphery orbital plane prepared in the circumference of the center of rotation, and the rotation member of another side. Said friction contact shall be canceled because said cam side maintains said engagement child at the center valve position of this cam side. A lock discharge means consists of following cages and guidance means. A cage shall hold said engagement child in the location regulation condition in the hand of cut of a rotation member. By predetermined external force being added, said guidance means shall change said cage into a restricted condition to said rotation member so that said engagement child's location may turn into said center valve position of said cam side. In this configuration, an engagement child does friction contact in the periphery orbital plane of one rotation member, and the cam side of the rotation member of another side, and rotation of the forward reverse both directions between these rotation members is always locked. At this time, an engagement child is in the location which inclined in the direction of either from the center valve position of a cam side. If predetermined external force is given to a cage, a cage is guided with a guidance means, moves a little, and locates in the center valve position of said cam side the engagement child who holds. Said friction contact is canceled by an engagement child being maintained at a center valve position, and, thereby, the relative rotation of both the rotation member of said cam side is attained in both directions.

[0007] In 2-way coincidence slip / lock change clutch of this configuration, it is good also as a next configuration. Said 1st and 2nd rotation members are used as the member located in and abroad mutually, and make said periphery orbital plane and cam side the field which counters in the direction of a path of these rotation member. Said cam side is established in two or more places of the circumferential direction of a rotation member. Said engagement child is taken as the rolling element prepared for said every cam side. Moreover, it shall be formed so that the center section of the rotation member circumferential direction may become it is deep and gradually shallow on both sides, and that center section shall serve as said center valve position, said cam side shall be this center valve position, and the direction clearance of a path between some shall produce it at said periphery orbital plane and cam face-to-face spacing to the path of said rolling element. If relative rotation of the direction of either always arises a little in the 1st and 2nd rotation member in this configuration, with this rotation, the rolling element which is an engagement child will move a cam side to the shallow location which inclined from the center valve position, will carry out friction contact at a cam side and a periphery orbital plane, and will prevent rotation beyond it of a rotation member. When a rotation member rotates to the above and hard flow, a rolling element moves to the location which inclined toward the above and hard flow from the center valve position of a cam side, and prevents rotation of the body of revolution beyond it. If predetermined external force is given to a cage, a cage is guided with a guidance means, moves a little, and locates the rolling element currently held in the deepest center valve position of a cam side. Therefore, the lock of rotation of both directions is canceled by coincidence.

[0008] Moreover, in this configuration, it is good also considering each part as a next configuration. Said guidance means shall become by the cage fixed slot established in the rotation member by the side of formation of said cam groove, and either of said cages, and the engagement projected part prepared in another side, in the state of un-giving [of said external force], a these cage fixed slot and an engagement projected part loosen mutually, and it shall gear in the condition and they shall gear densely in the state of grant of said external force. The elastic body which gives predetermined frictional force is prepared between said cages and rotation members by the side of said periphery orbital plane. In this configuration, the cage fixed slot and the engagement projected part loosened, it has geared in the condition, and relative rotation with a cage and the rotation member by the side of a cam side is always attained in this slack range. Therefore, the function to hold a rolling element in the center valve position of a cam side with a cage is not produced, but rotation of the both directions of both the rotation member is locked by friction contact of a rolling element as mentioned above. If predetermined external force is given to a cage, an engagement projected part gears with a cage fixed slot densely, and a cage will be restrained by the rotation member by the side of a cam side, and will hold the rolling element currently held in the center valve position of a cam side. Therefore, rotation of the both directions of a rotation member is attained. When making it into a lock condition again except for external force after lock discharge, an elastic body produces the circumference of the companion of the cage by rotation of the rotation member by the side of a periphery orbital plane, and, thereby, produces a lock certainly so that a rolling element may move to the shallow location of a cam side.

[0009] Furthermore, in this configuration, it shall gear in the direction of a path mutually, and said cage makes said cage fixed slot and an engagement projected part the quality of the material in which elastic deformation is possible by said external force. A pivotable operating member may be prepared on the center of rotation of said rotation member, and this heart, and the cam side for actuation which makes the direction force of a path it is weak to said external force with rotation of an operating member at this operating member and said cage act on said cage may be established. If an operating member is rotated from a rotation lock condition in this configuration, in an operation of the cam side for actuation, the direction force of a path will be given to a cage, a cage will carry out elastic deformation by this direction force of a path, and an engagement projected part will gear with a cage fixed slot densely. As mentioned above, a rolling element is held in the center valve position of a cam side, and rotation of the both directions of a rotation member of it is attained from this.

[0010] This cage fixed slot and an engagement projected part are good also as that which gears to shaft orientations mutually. In this case, on the center of rotation of a rotation member, and this heart, the side face of said cage is met, a pivotable operating member is prepared, and the cam side for actuation which makes the axial force which turns into said external force with rotation of an operating member at this operating member and said cage act on said cage is established. Moreover, the elastic body for a return which energizes said operating member in the direction which separates from a cage is prepared. If an operating member is rotated from a rotation lock condition in this configuration, in an operation of the cam side for actuation, axial force will be given to a cage and an engagement projected part will gear with a cage fixed slot densely. As mentioned above, a rolling element is held in the center valve position of a cam side, and rotation of the both directions of a rotation member of it is attained from this.

[0011]

[Embodiment of the Invention] The 1st operation gestalt of this invention is explained with drawing 1 thru/or drawing 7. This 2-way coincidence slip / lock change clutch consists of the inner ring of spiral wound gasket 1 which is the 1st rotation member, the outer ring of spiral wound gasket 2 which is the 2nd rotation member, a rolling element 3 which is the engagement child who consists of time, a cage 4, and elastic bodies 5, such as flat spring, and the below-mentioned lock means 12 and the below-mentioned lock discharge means 13 are established. So to speak, this 2-way coincidence slip / lock change clutch applies 2 Wake latch's basic structure.

[0012] The inner ring of spiral wound gasket 1 is formed in the shape of a thick cylinder, as shown in drawing 2, and the cam side 6 for demonstrating the lock function as a clutch is established in the outer-diameter side at two or more places of a circumferential direction. Each cam side 6 is established at equal intervals. These cam side 6 is formed so that the center section of the circumferential direction may become it is deep and gradually shallow on both sides, and it is made in general into the V character-like cross-section configuration. This cam side 6 may be a straight line-like like drawing 3 (A), or as shown in this drawing (B), it may have the shape of a curved surface, such as the shape of concave radii. The aperture include angle alpha of the shape of V character of the cam side 6 is set as 155 degrees - 175 degrees. Although the cam side 6 is established in the overall length of the shaft orientations of an inner ring of spiral wound gasket 1, it may be established in some shaft orientations. The cage fixed slot 7 is established in the outer-diameter side of the end panel of one side of an inner ring of spiral wound gasket 1 at two or more places of a circumferential direction. For example, the cage fixed slot 7 is formed a cam groove 6 and by turns. The cage fixed slot 7 is the thing of the cross-section configuration to which the core of a flute width becomes deep, and is made in general into the V character-like cross-section configuration in this example. The V character-like inclination is made into the steep slope compared with the cam groove 6. In addition, although [an inner ring of spiral wound gasket 1 / this example] it is cylindrical, it may be a shaft. That is, the cam groove 6 and the cage fixed slot 7 may be directly processed into the shaft.

[0013] As shown in drawing 1, it is referred to as cylinder side-like periphery orbital plane 2a by the outer ring of spiral wound gasket 2 so that **** may be possible for the rolling element 3 which consists a part for the bore surface part of time. A lock means 12 to prevent relative rotation of the forward reverse both directions of an inner ring of spiral wound gasket 1 and an outer ring of spiral wound gasket 2 consists of periphery orbital plane 2a of an outer ring of spiral wound gasket 2, a cam groove 6 of an inner ring of spiral wound gasket 1, and a rolling element 3. Although the outer ring of spiral wound gasket 2 is used as thick-cylinder-like components in this example, outer-diameter sides may be not only a cylinder side but a wheel configuration, and a pulley configuration or the arbitration configuration according to the other purposes. Moreover, in this example, the outer ring of spiral wound gasket 2 is formed in narrow rather than the inner ring of spiral wound gasket 1 and the cage 4 so that the outer-diameter side by the side of the engagement projected part 9 (it mentions later) of a cage 4 may be exposed.

[0014] The engagement projected part 9 which a cage 4 is formed in the shape of a cylinder as shown in drawing 4, the pocket 8 holding a rolling element 3 is penetrated and formed in two or more places of a circumferential direction at the diameter of inside and outside, and gears with each cage fixed slot 7 of an inner ring of spiral wound gasket 1, and the pin 10 for spring immobilization are respectively formed in hoop direction two or more parts. The engagement projected part 9 is formed in the bore side of a cage 4, and is made into triangular Yamagata. The pin 10 for spring immobilization is formed in end panel with the engagement projected part 8 in a cage 4, and the end panel of the opposite side. The guidance means 14 consists of an engagement projected part 9 of a cage 4, and a cage fixed slot 7 of an inner ring of spiral wound gasket 1. Moreover, the lock discharge means 13 consists of this guidance means 14 and cage 4.

[0015] Drawing 5 shows the condition of having attached the elastic body 5 to a cage 4. An elastic body 5 consists of flat spring which consists of ring-like side plate 5a and two or more piece of spring 5b of the shape of an arm prolonged in a radial from this side plate. Piece of spring 5b is bent so that it may extend in a slanting outer-diameter side from side plate 5a and the amount of point may become shaft orientations and abbreviation parallel, and the amount of the point forces it on the bore side of an outer ring of spiral wound gasket 2, and it contacts a condition. An elastic body 5 inserts in the hole of side plate 5a the pin 10 for spring immobilization prepared in the cage 4, and is being fixed to the cage 4 by fastening *****. Immobilization of an elastic body 5 is based on fastening, and also joining, a **** stop, a rivet stop, or adhesion is sufficient as it.

[0016] Since the function a cage 4 holds, takes and turns [a function] around fixed frictional force to rotation of an outer ring of spiral wound gasket 2 should just be obtained, elastic bodies other than a spring member, such as rubber, may be used for an elastic body 5. For example, as a modification is shown in drawing 9, elastic body 5A of the shape of a ring which consists of an O ring etc. is embedded in the periphery slot established in the outer-diameter side of a cage 4, or contrary to this, you may form a periphery slot in the bore side of an outer ring of spiral wound gasket 2, and may also embed a ring-like elastic body. The line spring or flat spring (not shown) crooked in the wave instead of may be used for a ring-like elastic body. [an O ring] Moreover, you may make it embed elastic body 5B in the crevice locally established in the outer-diameter side of a cage 4, as shown in drawing 10. Furthermore, a cage 4 is made into a polygon, or a projected part is prepared in the outer-diameter side of a cage 4. and the fixed frictional force which is extent which two or more places of the hoop direction of a cage 4 take to an

outer ring of spiral wound gasket 2 in the bore side of an outer ring of spiral wound gasket 2 with the elasticity of cage 4 the very thing, and the surroundings produce may be made to be acquired instead of preparing such an elastic body.

[0017] The clutch symbol description of the above-mentioned configuration and auxiliary explanation of a configuration are given. In the state of the ideal in the natural condition which shows in drawing 1, like drawing 6 (A), there is a rolling element 3 in the center (center valve position) of the cam side 6, and, as for the engagement projected part 9 of a cage 4, and the cage fixed slot 7 of an inner ring of spiral wound gasket 1, a phase's corresponds with coincidence in the location of a hoop direction. Moreover, the pocket 8 of the cage 4 for putting in a rolling element 3 is designed so that the hoop direction clearance to a rolling element 3 may turn into that it is very small (1% or less of the diameter of a rolling element 3), or a negative clearance. In this condition, as shown in drawing 1 (B), when a cage 4 is pushed against an inner ring of spiral wound gasket 1 by external force F in the direction of a path from an outer-diameter part, like drawing 6 (B), the pushed part bends, the clearance between the engagement projected part 9 of a cage 4 and the cage fixed slot 7 of an inner ring of spiral wound gasket 1 of a cage 4 is lost, and, as for a cage 4, the phase relation of a hoop direction is fixed to an inner ring of spiral wound gasket 1. Consequently, the rolling element 3 of total is compulsorily held in the center which is the center valve position of the cam side 6. The part which pushes a cage 4 to an inner ring of spiral wound gasket 1 has the desirable part equally divided into 2-4 to a circumferential direction.

[0018] In this condition, relative rotation of an inner ring of spiral wound gasket 1 and the cage 4 cannot be carried out in a hoop direction. Moreover, when located in the center of the cam side 6, the rolling element 3 is set up so that it may have few clearances between radial to an outer ring of spiral wound gasket 2 (the clearance between hoop directions is also produced as a result). Therefore, the rotation lock function as a clutch is lost in this condition. Namely, rotation of an outer ring of spiral wound gasket 2 is attained in any direction of the forward direction (for example, it considers as a clockwise rotation), and hard flow.

[0019] If the external force F which pushes a cage 4 is removed, it will return to the condition of drawing 6 (A). From this condition, by immobilization, an outer ring of spiral wound gasket 2 will begin rotation clockwise to rotation and coincidence of an outer ring of spiral wound gasket 2 according to the effectiveness of the frictional force according [a cage 4] to the spring member 5, if an inner ring of spiral wound gasket 1 rotates clockwise. Consequently, although it is very small angle of rotation since the rolling element 3 contained by the pocket 8 of a cage 4 also rotates clockwise to coincidence, a rolling element 3 interferes someday with the cam side 6 of an inner ring of spiral wound gasket 1. As the condition that the rolling element 3 interfered with the cam side 6 of an inner ring of spiral wound gasket 1 is shown in drawing 7, as for the point of contact of the cam side 6 and an outer ring of spiral wound gasket 2, and the include angle beta to make, a rolling element 3 becomes 5-25 degrees [180 degree- (155 degrees - 175 degrees)]. This include angle is known as a SUTORATO angle of a common clutch.

[0020] If it will be in the condition of drawing 7 (A), an outer ring of spiral wound gasket 2 will become impossible [rotating clockwise more than it]. That is, the rotation lock function as a clutch will arise here. In this case, the engagement projected part 9 of a cage 4 is set as a dimension which does not interfere in the cage fixed slot 7 of an inner ring of spiral wound gasket 1 yet. Also when an outer ring of spiral wound gasket 2 rotates counterclockwise, each part article carries out the same motion as the above, and a rotation lock function produces it. That is, unless external force F is given to a cage 4, an outer ring of spiral wound gasket 2 cannot be rotated counterclockwise clockwise. What is necessary is to apply external force F again to a cage 4, and just to push a cage 4 against an inner ring of spiral wound gasket 1, when returning the original bidirectional rotation to a slip condition. Since a rolling element 3 moves in the center of the cam side 6, the rotation lock function of it is lost again.

[0021] Thus, this 2-way coincidence slip / lock change clutch can be changed to considering as a slip condition in any direction of a clock and a counterclockwise rotation at coincidence, and the condition of producing a rotation lock function in coincidence, by applying external force F to a cage 4. For this reason, for example, when this clutch is used with the bearing for a wheelbarrow or doors, if its hold is released, the safe device in which it has stopped at that location can realize a wheel and a door cheaply.

[0022] Drawing 8 shows the example which formed the operating member 16 for external force grant to 2-way coincidence slip / lock change clutch shown in drawing 1 - drawing 7. An operating member 16 is a member of the shape of a ring which has lever section 16a in a part of circumferential direction, and the outer-diameter side of a shaft 20 in which the inner ring of spiral wound gasket 1 was attached is made to have made fitting of the rotation of it free. An inner ring of spiral wound gasket 1 turns to said level difference side 20a side the end panel which separates from the level difference side between the narrow diameter portion of a shaft 20, and a major diameter a little, and has fixed to the fitting condition in the narrow diameter portion, and has the cage fixed slot 7, and is arranged, and the operating member 16 intervenes between an inner ring of spiral wound gasket 1 and said level difference side 20a. the collar with which an operating member 16 is located in the periphery of a cage 4 — it has ring section 16b of a **, and the cam side 17 for actuation, which makes the direction force of a path it is weak to said external force F with rotation of an operating member 16 act on a cage 4 is established in hoop direction two or more parts (illustration four places) of the bore side of this ring section 16b. The cam side 17 for actuation is formed in the straight line used as some bowstrings of a circle used as the bore side of ring section 16b. Moreover, two or more cam sides 18 for actuation which touch the cam side 17 for these actuation respectively are formed in the outer-diameter side of a cage 4 by the projected part of a circular cross section.

[0023] Thus, when an operating member 16 is formed, if an operating member 16 is turned a predetermined include angle (the example of illustration about 45 degrees) from the rotation lock condition shown in drawing 8 (A), the cam side 17 for actuation and 18 comrades will be engaged for each other, and the external force of the direction of a path which pushes a cage 4 against an inner ring of spiral wound gasket 1 will be given to a cage 4 from an operating member 16. Thereby, a cage 4 bends and it will be in the discharge condition of the rotation lock as a clutch. If an operating member 16 is returned to the include angle of original drawing 8 (A), a cage 4 will return to the original configuration with elasticity, and will return to a rotation lock condition. In addition, the example of this drawing is the same configuration as the example shown in the cage 4 at drawing 1 - drawing 7 except for having established the cam side 18 for actuation, and having formed the operating member 16.

[0024] Drawing 11 thru/ or drawing 14 show the 2nd operation gestalt of this invention. This example changes a rotation lock condition and a lock discharge condition by giving the external force of shaft orientations to a cage 4. This example is drawing 1 thru/ or the same structure as the example of drawing 7 except for having changed the configuration of guidance means 14A which consists of a part of cage 4 and inner ring of spiral wound gasket 1, and the width of face of an outer ring of spiral wound gasket 2. However, a cage 4 does not need to be the quality of the material in which elastic deformation is possible. As shown in drawing 12, cage fixed slot 7A which gears with engagement projected part 9A (drawing 13) of a cage 4 is prepared in a part of end panel of an inner ring of spiral wound gasket 1. A cage 4 shall have a flange 19 in the 1 side of a bore side, and engagement projected part 9A is prepared inside this flange 19. Cage fixed slot 7A considers as V groove, and engagement projected part 9A is made into Yamagata of the shape of a triangle corresponding to this cage fixed slot 7A of V groove. Guidance means 14A is

constituted by these cage fixed slot 7A and engagement projected part 9A. The configuration of the cam groove 6 of an inner ring of spiral wound gasket 1 is the same as the example of drawing 1.

[0025] At this example, it is the external force FA of shaft orientations about a change in a slip condition and the rotation lock condition. It carries out by pushing a cage 4 against an inner ring of spiral wound gasket 1. If a cage 4 is pushed against shaft orientations, since cage fixed slot 7A of an inner ring of spiral wound gasket 1 will gear with engagement projected part 9A of a cage 4, a cage 4 will be fixed to an inner ring of spiral wound gasket 1 and the rolling element 3 as well as the aforementioned example will be held in the center of the cam side 6, it will be in a slip condition to the both directions of a clock and a counterclockwise rotation. External force FA if it removes, it will be in a rotation lock condition to the both directions of a clock and a counterclockwise rotation like the 1st operation gestalt. In addition, in order to improve responsibility of a change in a slip condition and the rotation lock condition with the 2nd operation gestalt of drawing 11, it is desirable to establish a means to return a cage 4 positively, according to another external force P, as shown in drawing 11 (B).

[0026] Drawing 15 and drawing 16 show the example which prepared operating member 16A for external force grant to 2-way coincidence slip / lock change clutch of the operation gestalt shown in drawing 11 - drawing 14. Operating member 16A is the member of the shape of a ring which has lever section 16a in a part of circumferential direction, and the outer-diameter side of a shaft 20 in which the inner ring of spiral wound gasket 1 was attached is made to have made fitting of the rotation of it free. An inner ring of spiral wound gasket 1 turns to said level difference side side the end panel which separates from level difference side 20a between the narrow diameter portion of a shaft 20, and a major diameter a little, and has fixed to the fitting condition in the narrow diameter portion, and has cage fixed slot 7A, and is arranged, and operating member 16A intervenes between an inner ring of spiral wound gasket 1 and said level difference side. It follows on rotation of operating member 16A in hoop direction two or more parts (illustration four places) of the end panel of a cage 4, and the field which counters, and operating member 16A is said external force FA. Cam side 17A for actuation which makes the weak direction force of a path act on a cage 4 is prepared. Moreover, two or more cam side 18A for actuation which touches respectively cam side 17A for these actuation is formed in the end panel of a cage 4. The cam sides 17A and 18A for these actuation are made into Yamagata of the shape of V character of loose inclination. The part between cam side 17A for ***** actuation is set to flat surface part 17B. In addition, this loose V character-like Yamagata of inclination — either of the cam sides 17A and 18A for actuation — it was — partial heights are sufficient as others. Moreover, the elastic body 21 for a return which acquires said external force P is attached in the cage 4 in the built-in condition at drawing 16 B. This elastic body 21 for a return consists of flat spring, is prepared in the bore side of a cage 4 along the direction of a path, is inserted in the attachment slot 22, and is attached in the condition.

[0027] Thus, when operating member 16A is prepared, if operating member 16A is turned a predetermined include angle (the example of illustration about 45 degrees) from the rotation lock condition shown in drawing 15 (A), cam side 17 for actuation A and 18A comrade will be engaged for each other, and the external force of the shaft orientations which push a cage 4 against an inner ring of spiral wound gasket 1 will be given to a cage 4 from operating member 16A. Thereby, a cage 4 bends and it will be in the discharge condition of the rotation lock as a clutch. If operating member 16A is returned to the include angle of original drawing 15 (A), a cage 4 will return by the stability of the elastic body 21 for a return, and will return to a rotation lock condition. In addition, the example of this drawing is the same configuration as the example shown in the cage 4 at drawing 11 - drawing 14 except for having prepared cam side 18A for actuation, having prepared operating member 16A, and having formed the elastic body 21 for a return.

[0028] Drawing 17 shows the example which the sheet back for cars also hung down 2-way coincidence slip / lock change clutch A of this invention, and was used as an adjusting device whenever [angle-of-inclination]. The back board 31 of a sheet 30 is supported by the back board supporter material 32 free [engagement], and 2-way coincidence slip / lock change clutch A is arranged so that the tilt core and center position of this back board 21 may be in agreement. Either that inner ring of spiral wound gasket 1 and the outer ring of spiral wound gasket 2 are fixed to the back board supporter material 32, and, as for this clutch A, another side is fixed to a back board 31. In addition, the return spring 33 energized to a standing-up side is formed in the back board 31. Clutch A may be the thing of which said operation gestalt.

[0029] In addition, although the rolling element 3 was used as an engagement child in contact with the cam side 6 with said each operation gestalt, the engagement child of the cross-section configuration of a non-round shape may be used instead of a rolling element 3. Moreover, with said each operation gestalt, although the cam side 6 was established in the inner ring of spiral wound gasket 1 and periphery orbital plane 2a was respectively established in the outer ring of spiral wound gasket 2, contrary to this, a periphery orbital plane may be established in an inner ring of spiral wound gasket 1, and a cam side may be established in an outer ring of spiral wound gasket 2. Furthermore, instead of considering as an inner ring of spiral wound gasket 1 and an outer ring of spiral wound gasket 2 like said each operation gestalt, the 1st rotation member and the 2nd rotation member may be used as the member which meets shaft orientations mutually, and may make a cam side and a periphery orbital plane meet shaft orientations.

* NOTICES *

JPO and NCIP1 are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.*** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The fracture front view of the clutch which (A) requires for the 1st operation gestalt of this invention, and (B) are the I-I line sectional views of this drawing (A).

[Drawing 2] It is the perspective view of the inner ring of spiral wound gasket of this clutch.

[Drawing 3] It is the expanded sectional view showing various kinds of examples of the cam side of this inner ring of spiral wound gasket.

[Drawing 4] It is the perspective view of the cage of this clutch.

[Drawing 5] It is a perspective view in the condition of having attached the elastic body in this cage.

[Drawing 6] It is an operation explanatory view.

[Drawing 7] It is the operation explanatory view of other operating state.

[Drawing 8] The fracture front view of an example with which (A) added the operating member to this clutch, and (B) are the fracture side elevation.

[Drawing 9] (A) is the perspective view of the modification of the combination of a cage and an elastic body, and (B) is the fragmentary sectional view.

[Drawing 10] It is the perspective view of other modifications of the combination object of a cage and an elastic body.

[Drawing 11] The partial notching fracture front view of the clutch which (A) requires for the 2nd operation gestalt of this invention, and (B) are that XI-X1 line sectional view.

[Drawing 12] It is the perspective view of the inner ring of spiral wound gasket of this clutch.

[Drawing 13] It is the perspective view of the cage of this clutch.

[Drawing 14] It is a perspective view in the condition of having attached the spring member in this cage.

[Drawing 15] For (A), the fracture front view of the example which added the operating member to this clutch, and (B) are the XIII-XIII. It is the fracture side elevation which meets a line.

[Drawing 16] The perspective view in which (A) shows the relation of the cage and operating member, the perspective view in the condition that (B) attached the spring member and the elastic body for a return in this cage, and (C) are the perspective views of the elastic body for a return.

[Drawing 17] It is the side elevation of an adjusting device whenever [adapting 2-way coincidence slip / lock change clutch of this invention / sheet back board angle-of-inclination].

[Drawing 18] It is the sectional view of the conventional example.

[Drawing 19] It is the sectional view of other conventional examples.

[Description of Notations]

- 1 — Inner ring of spiral wound gasket (1st rotation member)
- 2 — Outer ring of spiral wound gasket (2nd rotation member)
- 3 — Rolling element (engagement child)
- 4 — Cage
- 5 — Elastic body
- 6 — Cam side
- 7 — Slot for cage immobilization
- 9 — Engagement projected part
- 12 — Lock means
- 13 — Lock discharge means
- 14 — Guidance means
- 14A — Guidance means
- 16 — Operating member
- 16A — Operating member
- 17 18 — Cam side for actuation
- 17A, 18A — Cam side for actuation
- 21 — Elastic body for a return
- F — External force
- FA — External force

[Translation done.]